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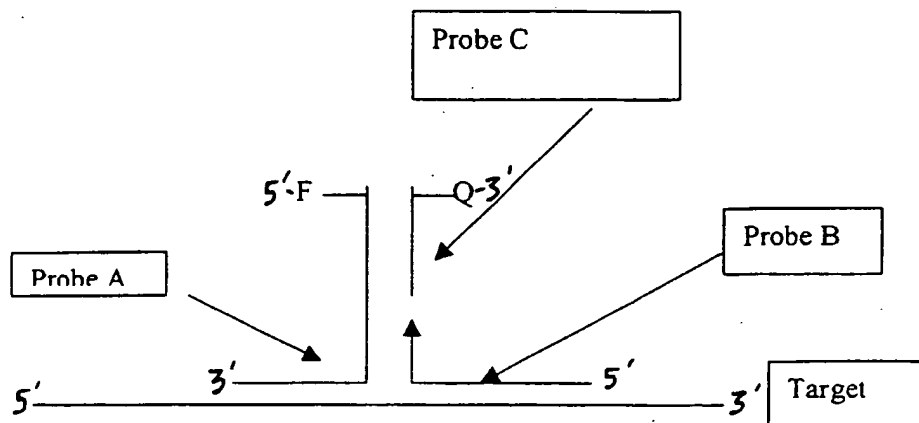
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(54) Title: METHODS AND PROBES FOR DETECTION AND/OR QUANTIFICATION OF NUCLEIC ACID SEQUENCES



(57) Abstract: The present invention discloses nucleic acid detector probes for specific detection and/or quantification of target nucleic acid sequences and detection and/or quantification methods using these probes. In the absence of target nucleic acid sequence, a first oligonucleotide and a third oligonucleotide are bound to each other in a conformation which brings two member of an interacting moiety pair (labels) into close spatial proximity. Cooperative binding of the first oligonucleotide and a second oligonucleotide to a target nucleic acid sequence causes displacement of the third oligonucleotide from the first oligonucleotide probe resulting in separation of the two members of the interacting moiety pair (labels). The spatial separation of the moieties (labels) is detectable, and indicates the presence and/or amount of the target nucleic acid sequence. The method is useful for detection and/or quantification of a specific nucleic acid sequence as well as the detection of sequence alteration in the target nucleic acid sequence.

INTERNATIONAL SEARCH REPORT

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IPC 7 C12Q1/68

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C12Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 99 42616 A (DADE BEHRING INC) 26 August 1999 (1999-08-26) the whole document	1-29, 33-46
Y	WO 00 15848 A (GENELABS TECH INC) 23 March 2000 (2000-03-23) page 4, line 28 -page 5, line 30 page 11 -page 12, paragraph C. page 23 -page 24, paragraph C. claims	1-46
Y	EP 0 909 823 A (BECTON DICKINSON CO) 21 April 1999 (1999-04-21) the whole document	31, 32
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	NADEAU J G ET AL: "REAL-TIME, SEQUENCE-SPECIFIC DETECTION OF NUCLEIC ACIDS DURING STRAND DISPLACEMENT AMPLIFICATION" ANALYTICAL BIOCHEMISTRY, vol. 276, no. 2, 15 December 1999 (1999-12-15), pages 177-187, XP000906307 ISSN: 0003-2697 cited in the application the whole document	30
A	WO 00 06778 A (NEW YORK HEALTH RES INST) 10 February 2000 (2000-02-10) the whole document	1-46
A	WO 99 42615 A (DADE BEHRING INC) 26 August 1999 (1999-08-26) the whole document	1-46
A	PATEL R ET AL: "Formation of chimeric DNA primer extension products by template switching onto an annealed downstream oligonucleotide" PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF USA, vol. 93, April 1996 (1996-04), pages 2969-2974, XP002158856 ISSN: 0027-8424 cited in the application	

INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9942616	A	26-08-1999	WO 9942616 A1	26-08-1999
WO 0015848	A	23-03-2000	US 6420109 B1	16-07-2002
			AU 5916399 A	03-04-2000
			WO 0015848 A1	23-03-2000
			US 6355428 B1	12-03-2002
EP 0909823	A	21-04-1999	US 5935791 A	10-08-1999
			CA 2244964 A1	23-03-1999
			EP 0909823 A2	21-04-1999
			JP 11155598 A	15-06-1999
			US 6130047 A	10-10-2000
			US 6261784 B1	17-07-2001
WO 0006778	A	10-02-2000	US 6037130 A	14-03-2000
			AU 5240299 A	21-02-2000
			CA 2336489 A1	10-02-2000
			EP 1100971 A1	23-05-2001
			JP 2002521069 T	16-07-2002
			WO 0006778 A1	10-02-2000
WO 9942615	A	26-08-1999	EP 0988400 A1	29-03-2000
			WO 9942615 A1	26-08-1999